ITS PROJECT APPLICATION FORM
FY 2009-2013 TIP

General Instructions: This form is to be used to request federal Congestion Mitigation and Air Quality (CMAQ) funding available through the Maricopa Association of Governments for Intelligent Transportation System (ITS) projects to be included in the FY 2009-2013 MAG Transportation Improvement Program. Currently funding is available only for **FY 2013**.

Separate application forms are available for bicycle, pedestrian, air quality, and transit projects. Freeway, street and rail transit projects will be programmed in a separate process.

This application form includes:

- Part A: Project Description and TIP Listing Information. In Part A, the applicant provides the minimum information necessary to list a project in the TIP as required by applicable federal regulations and general descriptive information necessary for MAG staff and technical committees to evaluate the project.

- Part B: Project Congestion Management System (CMS) and Congestion Mitigation Air Quality (CMAQ) Data: In Part B, the applicant provides data necessary for MAG staff to calculate CMS and CMAQ scores for projects.

- Part C: MAG Technical Committee Additional Information. This section is used to collect information requested by the MAG ITS Committee. The MAG ITS Committee is charged with evaluating and recommending ITS projects for federal funding. **PLEASE NOTE: Part C is only available electronically.** It is available at: http://www.mag.maricopa.gov/project.cms?item=413, or you can contact Leo Luo: lluo@mag.maricopa.gov, and he will send you the electronic file.

Deadlines and Transmittal Instructions: All sections should be completed and returned to MAG Offices by **5:00 p.m. September 7, 2007.** Please e-mail Judy Tadlock at MAG, jtadlock@mag.maricopa.gov this application (Part A & B). Part C is only available electronically as noted above. Please e-mail Leo Luo the completed Part C, excel file to lluo@mag.maricopa.gov. The mailing address and FAX number for the MAG offices is:

ATTN: Judy Tadlock
Maricopa Association of Governments
302 North 1st Avenue, Suite 300
Phoenix, Arizona 85003
FAX Number: (602) 254-6490

Electronic Download Information: A downloadable version of these forms in Microsoft Word is available on the MAG website at http://www.mag.maricopa.gov/project.cms?item=413. If requested, MAG staff will also provide these forms via e-mail or FAX.

MAG Contact Information: If you have any questions, please contact Stephen Tate or Eileen Yazzie at (602) 254-6300 or at state@mag.maricopa.gov.

Agency Contact Information: Please complete the following contact information for each project, so that we may contact you should we need additional information.

1.	Name of the Agency Contact for the Project Request: **Jeffrey Jenq**	2.	Telephone: **480-644-5187**
3.	E-mail **Jeff.Jenq@cityofmesa.org**	4.	Date: 09-04-2007

ITS PROJECT APPLICATION FORM – FY 2009-2013 TIP
Part A: Project TIP Listing Information and Description

Section One: TIP Listing Information.

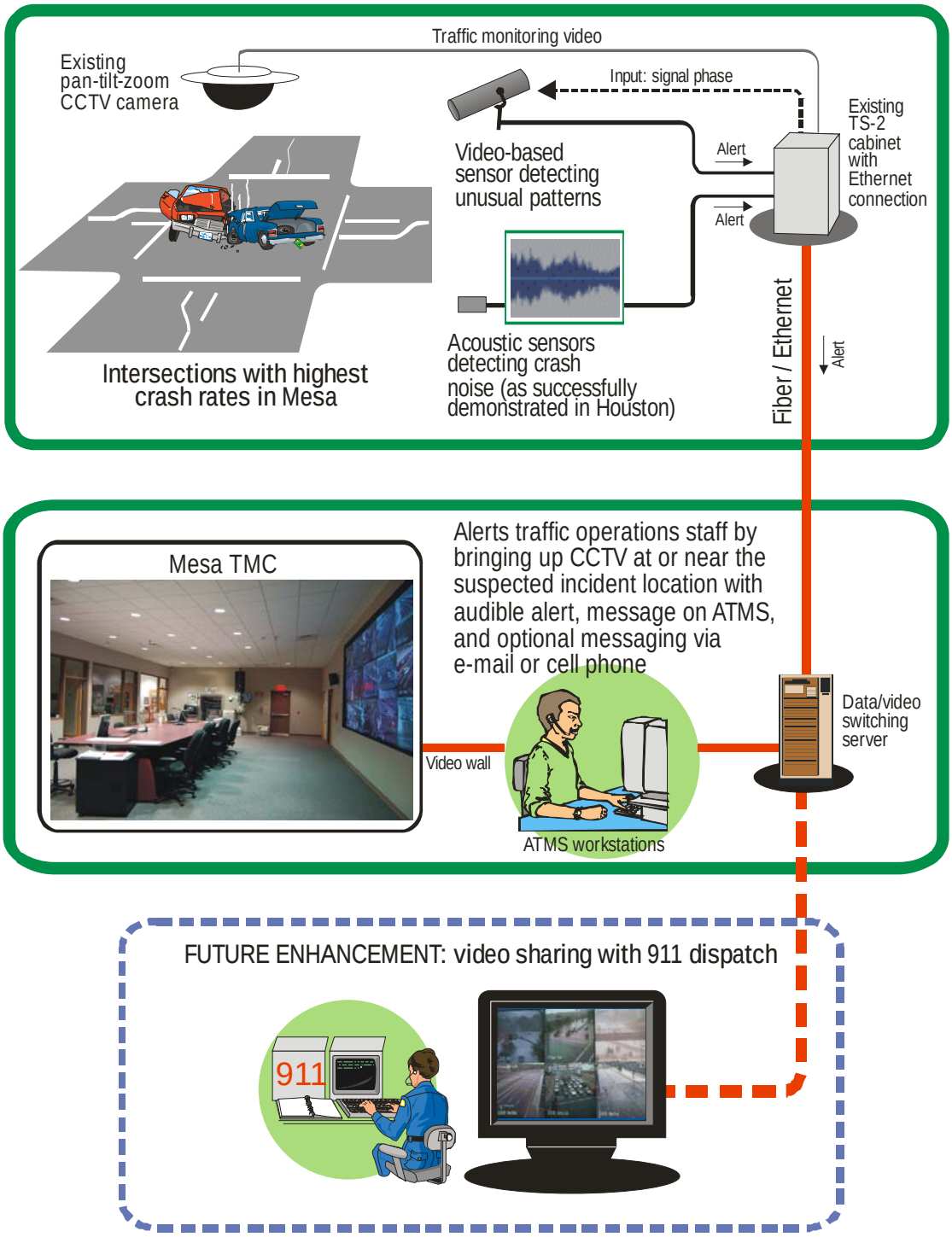
Please complete the following information for all projects. If the project is accepted for MAG federal funding, the project information provided in this section will appear in the TIP as provided by the applicant

1. Sponsoring Agency Name: **City of Mesa**	2. Year (Please check box): **X** FY 2013
3. Project Location (The project limits if applicable): **Ten (10) intersections with highest crash rates within City of Mesa.** **This project has city-wide potential. That is, the software implemented at the Transportation Management Center (TMC) is capable of supporting a large number of intersections as funds for additional sensors become available in the future.**	
4. Type of Work (Description of the work to be performed): **This project will implement video and acoustic sensors in the field to automatically detect and alert traffic operations staff of suspected crash or traffic impeding events. The communications will be facilitated using existing traffic controller cabinets with Ethernet and fiber connections to Mesa's Transportation Management Center (TMC). The scope also includes modifications to systems in the TMC to automatically bring up available CCTV images at or near the monitored location on individual work stations and the video wall, while also displaying an alarm on the ATMS software, providing audible alerts, and optionally sending text messages to e-mail and/or cell phones. The automated field detection will significantly improve the ability to manage traffic impeding events and mitigate the adverse impacts. A future enhancement (not included in this scope) is to share the video and alerts with 911 dispatch.** **See MS Word document "Part A - Project description - City of Mesa - Automated field traffic detection FY2013.doc" for additional descriptions and a high-level system concept illustration diagram.**	
5. Amount of Federal Funds Requested (This amount cannot exceed **70.0** percent of the total cost of the project.): **$420,000**	6. Type of Federal Funds Requested (Please check box.): ☐ MAG STP **X** CMAQ
7. Amount of Local Funds to be used (This amount cannot be less than **30.0** percent of the total cost of the project.): **$180,000**	8. Type of Local Funds to be Used: (Please check only one box.): **X** HURF ☐ Impact Fees ☐ General Fund ☐ Bond Proceeds ☐ Sales Tax ☐ Private ☐ Property Tax ☐ Other, Please specify: _____
9. Total Cost of the Project: (This amount must equal the sum of the federal and local amounts requested): **$600,000**	

ITS PROJECT APPLICATION FORM – FY 2009-2013 TIP
Part A: Project TIP Listing Information and Description

10. Please attach a map, drawing, photograph, plans or other graphic showing the location of the project. If no graphic is available or it is not feasible to provide one, please indicate this fact in the space below.

Also see MS Word document "Part A - Project description - City of Mesa - Automated field traffic detection FY2013.doc" for additional descriptions and a high-level system concept illustration diagram



ITS PROJECT APPLICATION FORM – FY 2009-2013 TIP
Part B: CMS and CMAQ Data

General Instructions: In Part B, the applicant provides data necessary for MAG staff to calculate Congestion Management System (CMS) and CMAQ scores for projects.

Section One: Congestion Management System and CMAQ Data

Please complete the following information for all street projects. The information used in this section is used to calculate CMS scores.

1. Current Average Daily Traffic (ADT) on the Facility or the Nearest Parallel Facility of a Similar Type: **56,000 (per intersection)**	2. Name of the Roadway Section Used for the ADT Estimate: **Stapley Road and Broadway Road (a candidate site recently audited by ADOT Regional Safety Audit (RSA) team)**	3. Type of Facility to be Improved (Check only one box): ☐ Arterial > 4 legs (e.g. Grand) X Arterial Street ☐ Collector Street ☐ Other
4. Number of **Through** Lanes Currently on the Facility Prior to Project Completion (Do not include right, left or center turn lanes): **4**	5. Number of **Through** Lanes on the Facility After the Project is Completed (Do not include auxiliary lanes): **4**	6. Length of the Facility (in miles): **40 (1 mile per leg per intersection times 10 intersections)**
7. Township Coordinate of the Midpoint of the Facility: **T1N**	8 Range Coordinate of the Midpoint of the Facility: **R5E, R6E, R7E**	9. Section Coordinate of the Midpoint of the Facility: **1-36, 1-36, 1-36**

ITS PROJECT APPLICATION FORM – FY 2009-2013 TIP
Part B: CMS and CMAQ Data

10. If the project improves traffic signal coordination, please do the following:

a. Enter the pre-improvement (current) traffic speed of the traffic corridor: **40 MPH**

b. In the Table Check the Box in The Row That Best Describes the Project (Check Only One Box):

	Before (Pre-Improvement) Condition	After (Post Improvement) Condition	Expected Increase In Speed
☐	Non-interconnected, pre-timed signals with old timing plan	Advanced computer-based control	25.0 percent
☐	Interconnected, pre-timed signals with old timing plan	Advanced computer-based control	17.5 percent
☐	Non-interconnected signals with traffic-actuated controllers	Advanced computer-based control	16.0 percent
☐	Interconnected, pre-timed signals with actively managed timing	Advanced computer-based control	8.0 percent
X	Interconnected, pre-timed signals with various forms of master control and various qualities of timing plans	Optimization of signal timing plans. No change in hardware	12.0 percent
☐	Non-interconnected, pre-timed signals with old timing plan	Optimization of Signal Timing Plans	7.5 percent

11. Other Project Information: (Check as many as are applicable):

X Includes Traffic Signal Improvements for a Single Agency
☐ Includes Traffic Signal Improvements that Apply to More than One Agency
☐ Includes FMS Improvements
☐ The Project Conforms to Local Land Use Plans
☐ The facility is on the adopted MAG Roads of Regional Significance Network
☐ Adds Traffic Signals that increase pedestrian crossing time for seniors

12 Management System (Please check only one box)

X Congestion Management System (CMS)
☐ Bridge Management System (BMS)
☐ Pavement Management System (PMS)
☐ Public Transportation Management System (PTMS)
☐ Safety Management System (SMS)
☐ Intermodal Management System (IMS)
☐ Other

13. Please identify the priority the agency places on this project. If for example, the agency is submitting three requests for ITS projects and this is the agency's highest priority, then a "1" should be entered. Each priority entered should be unique – e.g. no two requests for ITS projects should have the same priority.

1

Part C: MAG Technical Committee Additional Information

This section is used to collect information requested by the MAG ITS Committee. The MAG ITS Committee is charged with evaluating and recommending ITS projects for federal funding. **Part C is only available electronically. It is available at: http://www.mag.maricopa.gov/project.cms?item=413, or you can contact Leo Luo: lluo@mag.maricopa.gov, and he will send you the electronic file.**

Contact Information

Please contact Sarath Joshua or Leo Luo at (602) 254-6300 or sjoshua@mag.maricopa.gov, lluo@mag.maricopa.gov for additional information or questions.

FY 2009 - 2013 TIP - Programming 2013
MAG ITS Project Data Form

Please enter project data ONLY in highlighted cells, save the file with the lead agency name in it - ie. Mesa ITS Projects.xls

Submit this Excel workbook to MAG via email to: LLUO@MAG.MARICOPA.GOV

Please use one worksheet per project, with the tab at the bottom indicating agency priority

Links to various websites are provided for additional information and help

The worksheet titled "Example" shows an example on how to enter Data in the highlighted areas. If errors are detected alerts will pop-up in red text.

The worksheet titled "HELP" shows how to figure out your project's ITS Subsystems & Architecture Flows

Please enter required information in highlighted cells

A. Project Title & Sponsor

Lead Agency	City of Mesa
Other Partnering Agencies	
ITS Project Title:	Mesa Automated Field Traffic Detection

B. Project Goals & Objectives

Project Goals:

It has become infeasible to systematically detect traffic events of interest with a large number of CCTV cameras deployed in the field. This poses a common challenge for jurisdictions that manage a large arterial street network. In light of the accelerated deployment of traffic signal infrastructure, the traffic operations staff at Mesa Transportation Management Center (TMC) need an automated means to

alert them of the occurrence of traffic impeding events.
This project will implement video and acoustic sensors in the field to automatically detect and alert traffic operations staff of suspected crash or traffic impeding events. The communications will be facilitated using existing traffic controller cabinets with Ethernet and fiber connections to Mesa's TMC. The scope also includes modifications to existing systems in the TMC to automatically bring up available CCTV images at or near the monitored location on individual work stations and the video wall, while also displaying an alarm on the ATMS software, providing audible alerts, and optionally sending text messages to e-mail and/or cell phones.

Objectives:

The automated field detection will significantly improve the ability to manage traffic impeding events and mitigate the adverse impacts in a timely fashion. While the proposed scope only includes 10 intersections with highest crash rates in Mesa (which have existing CCTV and fiber connection), the software/hardware implemented at TMC is capable of supporting more intersections as funds for additional field sensors become available in the future.
A future enhancement (not included in this scope) is to share the video and alerts with 911 dispatch. Ultimately, 911 dispatchers will be instantly alerted and use the CCTV to assess the scene of the accident before or while receiving the distress calls.

C. Define ITS Subsystems, Achitecture Flows, Communications & Arterial ITS Applications

SELECT ITS Subsystems: http://www.iteris.com/itsarch/html/entity/pa	Yes or No
Center Subsystem	Yes
Traveler Subsystem	No
Field/Roadside Subsystem	Yes
Vehicle Subsystem	No

Communications Subsystem	Yes

Architecture Flows (Information flows among four subsystems: Traveler, Center, Roadside and Vehicle Subsystems)

From Subsystem	To Subsystem	Information flow
Center	Roadside	Control CCTV and signal
Roadside	Center	Alert data, CCTV image
Center (TMC)	Center (911)	Alert data, CCTV image

Communications: Required communications medium for data sharing with other agencies: (if applicable)

From agency	To agency	data flow	Medium	Existing?	Future (year) mm/yyyy	Check Date with Project Schedule
N/A						

Arterial ITS applications	**Relevant Applications (ENTER: Yes or No)**	**Applicable ITS User Services Addressed http://www.iteris.com/itsarch/html/user/userserv.htm**	**Applicable ITS Market Packages http://www.iteris.com/itsarch/html/mp/mpindex.htm**
1. Traffic Management	Yes	1.6, 1.7	ATMS01, ATMS03,
2. Transit Operations Support	No		
3. Interagency Data Sharing and Control	Yes (future enhancement)	5.1	EM01
4. Integrated Traveler Information	No		
5. Archived Data Management	No		
6. Incident Management	Yes	5.1	EM01
7. Freeway-Arterial	No		

D. Project Budget

(1) The total of all federal funds requested for ITS projects by any MAG member agency should not exceed $1 million per program year per agency.

(2) Joint projects that involve 3 or more agencies may exceed $1m in federal cost. Federal cost of each agency's component will not be counted against the $1m limit.

(3) There is no limit on the number of projects that may be submitted by an agency, but each project requires the 30 percent local cost match

(4) For multijurisdictional projects, the federal and local shares of each partnering agency must be shown below.

	Federal Cost	Local Match (min 30%)	Total Cost
Lead Agency	$420,000.00	$180,000.00	**$600,000.00**
Partnering Agency#1			**$0.00**
Partnering Agency#2			**$0.00**
Partnering Agency#3			**$0.00**
Total	$420,000.00	$180,000.00	$600,000.00
Cost percentage	**70.0%**	**30.0%**	

Note: Each participating agency should provide at least 30% local match for its share of the total cost

E. Project Schedule

The following project milestones and schedules are based on a typical project procurement process. Please select applicable milestones. Some ITS projects may follow an abbreviated process. ENTER estimated time for such a process

Standard Project Milestones	Default Schedule for Process	Applicable Milestones (ENTER - Yes OR No)	Estimated Time to Milestone (ENTER #Months)	Estimated Date (Enter> mm/yyyy)
Apply for ADOT project number				Nov-2013
Receipt of ADOT project number	Jan-2014	Yes	2	Jan-2014

Initial DCR	Feb-2014	No	4	NA
Final DCR	Mar-2014	Yes	5	Mar-2014
30% Preliminary Plans, Cost Estimate and Report	May-2014	Yes	7	May-2014
60% Preliminary Plans, Cost Estimate and Report	Jul-2014		9	NA
Final Preliminary Plans, Cost Estimate and Report	Sep-2014	Yes	11	Oct-2014
Environmental Clearance	Jul-2014	No	9	NA
Utility Clearance	Aug-2014	No	10	NA
Right-of-Way Clearance	May-2014	No	10	NA
Approval of IGA	Nov-2014	Yes	14	Jan-2015
Obligation authority of Federal funds	Dec-2014	Yes	15	Jan-2015
Advertised Date	Feb-2015	Yes	16	Mar-2015
Final Deployment	Aug-2015	Yes	24	Nov-2015

F. System Maintenance and Operations

Current staff resources available for ITS operations at the local agency (FTEs)	11
Additional staff resources required for fully utilizing features added by project (FTEs)	0
Estimated current annual ITS operations & maintenance budget	$1,500,000
Estimated additional annual operations & maintenance funds required for features added by project	$0

Estimated DATE from when required additional O&M funds will be available

Other comments:

G. Systems Engineering Analysis Requirement

Commitment to address the federal requirement for Systems Engineering Analysis:
Agency's intent to follow the process described in the 'V' diagram (See Appendix A of Arterial ITS Plan) during the project development process

The project sponsor or lead agency intends to incorporate the Systems Engineering Analysis in the scope of work for the project's Design Concept Report. The Systems Engineering Analysis will be carried out based on the document Systems Engineering for ITS published by FHWA in Janaury 2007. A guidelines document prepared by FHWA (AZ office) and MAG dated August 2006 is also available (both are posted at the MAG website).

Project Description: City of Mesa – Automated Field Traffic Detection FY2013

1. **A system concept illustration diagram is attached (Figure 1).**

2. **Project description**

   It has become infeasible to systematically detect traffic events of interest with a large number of CCTV cameras deployed in the field. This poses a common challenge for jurisdictions that manage a large arterial street network. In light of the accelerated deployment of traffic signal infrastructure, the traffic operations staff at Mesa Transportation Management Center (TMC) need an automated means to alert them of the occurrence of traffic impeding events.

   This project will implement video and acoustic sensors in the field to automatically detect and alert traffic operations staff of suspected crash or traffic impeding events. The communications will be facilitated using existing traffic controller cabinets with Ethernet and fiber connections to Mesa's TMC. The scope also includes modifications to existing systems in the TMC to automatically bring up available CCTV images at or near the monitored location on individual work stations and the video wall, while also displaying an alarm on the ATMS software, providing audible alerts, and optionally sending text messages to e-mail and/or cell phones.

   The automated field detection will significantly improve the ability to manage traffic impeding events and mitigate the adverse impacts in a timely fashion. While the proposed scope only includes 10 intersections with highest crash rates in Mesa (which have existing CCTV and fiber connection), the software/hardware implemented at TMC is capable of supporting more intersections as funds for additional field sensors become available in the future.

   A future enhancement (not included in this scope) is to share the video and alerts with 911 dispatch. Ultimately, 911 dispatchers will be instantly alerted and use the CCTV to assess the scene of the accident before or while receiving the distress calls.

3. **Why project should receive MAG federal funding**

   The automated traffic detection functionality is essentially needed by all jurisdictions that manage large arterial street networks. This project will develop a practical solution, capitalizing on the existing traffic signal infrastructure (e.g., advanced signal controller, communications), that can be adopted in other jurisdictions. Mesa's technical staff would be happy to provide assistance in the future technology transfer.

4. **Multi-modal issues**

   The early detection of traffic impeding events mitigates adverse impacts affecting all vehicular traffic including personal, commercial vehicles and public transit.

6. Cost breakdown

An estimate of construction cost based on the summary of quantities and recent bid prices was prepared based on the 60% design level.

Description	Quantity	Cost
Software Development		$350,000
Equipment		$150,000
Integration of Field Devices		$100,000
	Total =	$600,000

7. Schedule for obligating project

Kick Off Meeting	November	2013
Complete Design Concept Report	March	2014
Preliminary Plans, Site Selection, Preliminary Cost Estimate (30%)	May	2014
Complete Plans, Request For Proposal (RFP)	October	2014
Job advertised	March	2014

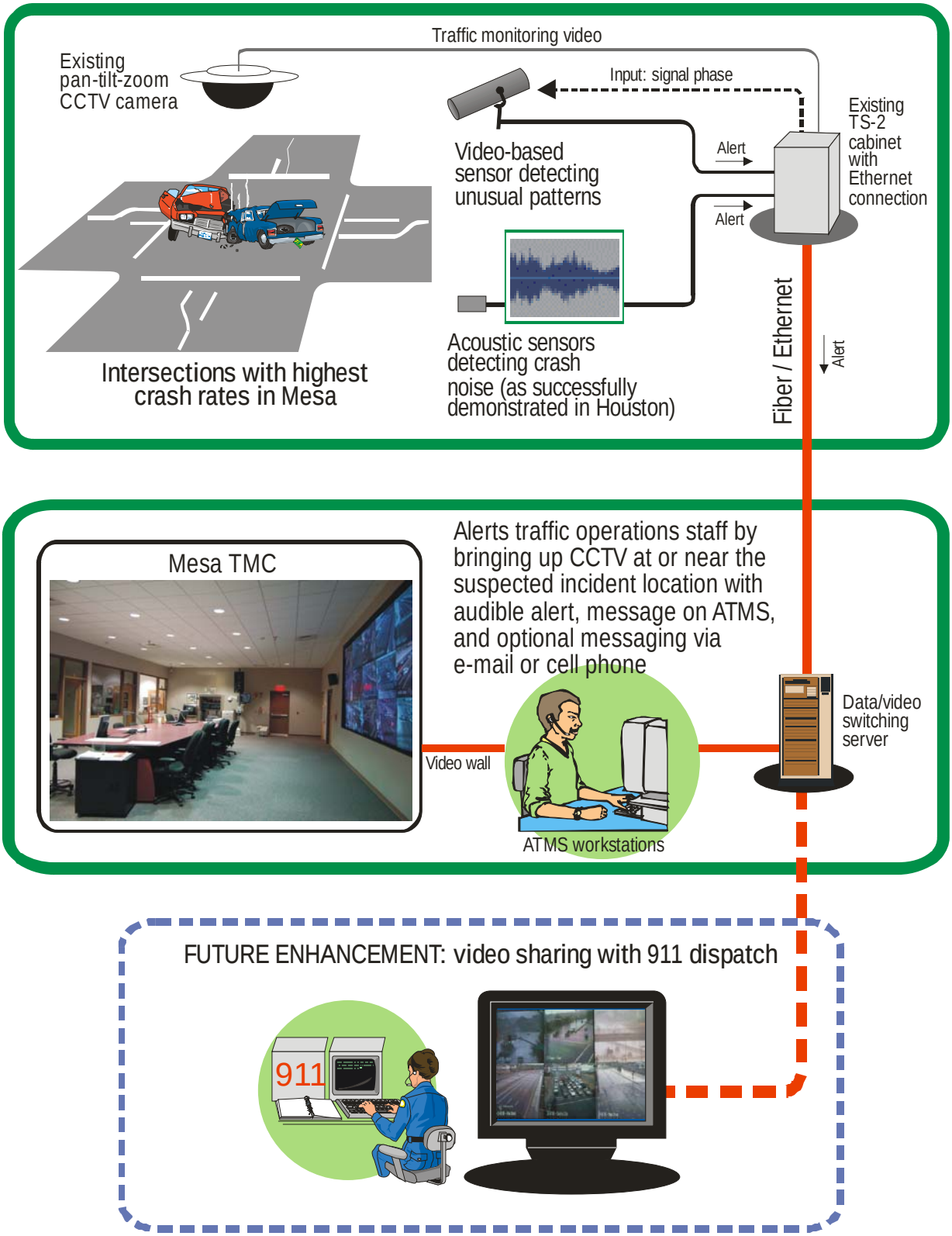


Figure 1. Automated Field Traffic Detection Concept Illustration